in the development of the embryo and in all the living cells of the adult, remain of the same number and specific constitution and arranged in the same chromosome-groupings as in the ripe egg-cell (or rather each cell reproduces all these features of its ancestral egg-cell). For, we are told, the process of mitosis, always and everywhere throughout the growing organism, results in two new nuclei exactly like one another, which become, by selective assimilation of matter, exactly like the parent nucleus.

The significance of this last fact seems to be but little appreciated by the geneticists. Their theory would require that differentiation of the tissue-cells should be accompanied by differentiation of the gene-content, some kind of sorting out of the genes, such that each specialized kind of cell—the brain-cell, the liver-cell, the muscle-cell, etc.—should have its own peculiar assortment of genes, or perhaps its own one gene of specific constitution determining the peculiar properties, form, and reactions of that cell. And, before the facts were known, this kind of sorting out or unpacking of the genes during development was confidently assumed by August Weismann and his many faithful disciples of mechanistic leanings.

The Bearing of Recent Changes in Physical Theory

The first third of the twentieth century has seen many bewildering changes of physical theory, most of which have been by no means favourable to the mechanical biology. In the later nineteenth century the mechanist

knew where he stood and what he stood on. He stood on a pile of atoms, solid, impenetrable, perhaps spherical, atoms, each of which manifested *in excelsis* the mechanical properties of a billiard ball Energy was